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EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/764,516	AUBIN ET AL.	
	Examiner	Art Unit	
	DAVID S. KIM	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _28 March 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-32_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-32_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. Applicant's response to the rejection of **claims 17-23** under 35 U.S.C. 101 in the previous Office Action (mailed on 28 November 2007) is noted and appreciated. Applicant responded by amending the claims. Applicant's response overcomes the previous rejection, which is presently withdrawn.

2. Applicant's response to the rejection of **claims 24-32** under 35 U.S.C. 101 in the previous Office Action (mailed on 28 November 2007) is noted and appreciated. Applicant responded by amending the claims. Applicant's response overcomes the previous rejection, which is presently withdrawn.

Claim Objections

3. **Claims 30 and 31** are objected to because of the following informalities:

In claims 30 and 31, "when executed analyzing" is used where "when executed, analyzing".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 1-13 and 17-29** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In particular, notice the following limitation from independent claim 1 (similar in independent claims 8, 17, and 24):

> (2) ***generating a basic optical capacity*** comprising a capacity value for each optical link ***based on*** optical network topology information and the ***basic packet capacity*** (emphasis Examiner's).

The support for this limitation comes from Applicant's Figs. 4 and 5 and p. 9, l. 14 – p. 12, l. 20. More exactly, the "***basic packet capacity***" is described as "the total capacity of each packet link in the simulated packet network" (p. 11, l. 24-26). In Fig. 5, "this is a sum of packet traffic flow capacities 36A

plus 36B travelling on the packet link 11" (p. 11, l. 26-28). Fig. 4 shows that this "***basic packet capacity***" is an input into "flow assignment for optical network 46". According to the claim limitation cited above, there is "***generating a basic optical capacity*** comprising a capacity value for each optical link ***based on*** …the ***basic packet capacity***". Somehow, the "***basic optical capacity***" is generated ***based on*** the "***basic packet capacity***".

However, Applicant's original disclosure is silent about this "***based on***" relationship between the "***basic optical capacity***" and the "***basic packet capacity***". Instead, Applicant's specification simply describes the "***basic packet capacity***" as "the total capacity of each packet link in the simulated packet network" (p. 11, l. 24-26) and as "a sum of packet traffic flow capacities 36A plus 36B travelling on the packet link 11" (p. 11, l. 26-28) in Fig. 5. Similarly, Applicant's specification simply describes the "***basic packet capacity***" as "the total capacity of each optical link the simulated packet transport network 48" (p. 12, l. 10-12) and as "the total capacities 47A, 47B, 47C, 47D" in Fig. 5. Such descriptions do not teach or suggest how "***generating a basic optical capacity*** comprising a capacity value for each optical link" is "***based on*** …the ***basic packet capacity***". Accordingly, this "***based on***" relationship between the "***basic optical capacity***" and the "***basic packet capacity***" is **not enabled**. Thus, these claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of

each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. **Claims 1-4, 8-9, 11, 17-20, 24-25, and 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Iovanna et al. (U.S. Patent Application No. US 2006/0209785 A1, hereinafter "Iovanna") in view of Nasrallah et al. ("NetCalc6 Tutorial and a Preview of NetCalc7", hereinafter "Nasrallah").

Regarding claim 1, Iovanna discloses:

A method for co-modelling a packet network and an optical network over which the packet network operates, the packet network representing a plurality of packet links between packet network nodes and the optical network representing a plurality of optical links between optical network nodes, the method comprising the steps of:

(1) generating a cost parameter (520 in Fig. 5; using this cost parameter implies that it is "generated" before it is used) comprising a cost value for each packet link (loop for other links through step 545 in Fig. 5; notice the incorporation of "C_{max}^{TL}", which is the maximum link total capacity in the network, paragraph [0087], which would incorporate the capacity value for each link) based on packet network topology information (nodes in paragraph [0066]) and packet traffic information (data packet in paragraph [0066]) and

(2) generating a basic optical capacity (paragraph [0069]; using this basic optical capacity implies that it is "generated" before it is used; notice the incorporation of the cost parameter by equivalence or by influence, paragraph [0069], which would incorporate "C_{max}^{TL}", which is the maximum link total capacity in the network, paragraph [0087], which would incorporate the capacity value for each link) comprising a capacity value for each optical link (loop for other links through step 545 in Fig. 5) based on optical network topology information (paragraph [0069]) and the cost parameter (paragraph [0069]).

Iovanna does not expressly disclose:

said packet network being a simulated packet network;

said optical network being a simulated optical network; and

the cost parameter comprising a basic packet capacity.

Regarding the *simulated* packet network and the *simulated* optical network, simulated networks are well known in the art, as shown by Nasrallah (“network design” on slide 9). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ simulated versions of the networks of Iovanna. One of ordinary skill in the art would have been motivated to do this to test the routing strategies and algorithms of Iovanna (paragraph [0028]) before deploying them into actual networks.

Regarding the cost parameter, notice that this parameter may refer to capacity (Iovanna, paragraphs [0067-0068]). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ a cost parameter that comprises a basic packet capacity. One of ordinary skill in the art would have been motivated to do this since one intuitive way to express a cost parameter is in terms of capacity/bandwidth. That is, capacity/bandwidth of a link is a limited resource that provides a constraint for traffic flows. When one discusses the cost of a traffic flow to a link, one generally considers the cost of that traffic flow to the available capacity/bandwidth of that link.

Regarding claim 2, Iovanna in view of Nasrallah discloses:

A method for co-modelling according to claim 1, wherein the step of generating a basic packet capacity further comprises the steps of:

(1) combining the packet network topology information in the form of a packet network topology input (e.g., the consideration of any two nodes in paragraph [0066]) and the packet traffic information in the form of a packet traffic matrix input (a matrix is a common way to tabulate links and their respective traffic assignments; notice the treatment of each link in paragraph [0076]) to create the simulated packet network; and

(2) assigning each packet link (loop for other links through step 545 in Fig. 5) of the simulated packet network a flow to create the basic packet capacity for the simulated packet network (e.g., 520 in Fig. 5;); and

wherein the step of generating a basic optical capacity further comprises the steps of:

(3) combining the optical network topology information in the form of an optical network topology input (e.g., the consideration of the physical level in paragraph [0069]) and the basic packet capacity (see the treatment of this limitation in claim 1 above) to form the simulated optical network; and

(4) assigning each optical link (loop for other links through step 545 in Fig. 5) of the simulated optical network a flow to create the basic optical capacity for the simulated optical network (notice the treatment of each link in paragraph [0076]).

Regarding claim 3, Iovanna in view of Nasrallah discloses:

A method for co-modelling according to claim 2, the method further comprising the steps of:

(1) supplying the packet network topology input (implied by the incorporation of the packet network topology input in claim 2);

(2) supplying the packet traffic matrix (implied by the incorporation of the packet traffic matrix in claim 2);

(3) supplying the optical network topology (implied by the incorporation of the optical network topology in claim 2).

Regarding claim 4, Iovanna in view of Nasrallah discloses:

A method for co-modelling according to claim 2, further comprising generating the packet network topology input, the packet traffic matrix input and the optical network topology input for use in co-modelling the simulated packet network and the simulated optical network over which the simulated packet network operates (generation of these limitations is implied by the incorporation of these limitations in claim 2).

Regarding claim 8, claim 8 is a method claim that corresponds largely to the method claim 1. Therefore, the recited steps in method claim 1 read on the corresponding steps in method claim 8. Claim 8 also includes limitations absent from claim 1. Iovanna in view of Nasrallah also discloses these limitations:

(3) performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates (e.g., 565 in Fig. 5, performance comparisons in Figs. 6-9;

analysis implied by “state information” in paragraphs [0062-0063]; “analysis” in paragraph [0066]; “check” in paragraph [0071]).

Regarding claim 9, claim 9 is a method claim that introduces limitations that correspond to the limitations introduced by method claim 2. Therefore, the recited steps in method claim 2 read on the corresponding steps in method claim 9.

Regarding claim 11, Iovanna in view of Nasrallah discloses:

A method for co-modelling and analyzing according to claim 8, wherein the step of performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprises network capacity planning of the simulated packet network and the simulated optical network over which the simulated packet network operates (performance comparisons in Figs. 6-9).

Regarding claims 17-20, 24-25, and 27, claims 17, 18, 19, 20, 24, 25, and 27 are computer usable medium claims that introduce limitations that correspond to the limitations introduced by method claims 1, 2, 3, 4, 8, 9, and 11, respectively. Therefore, the recited steps in method claims 1-4, 8-9, and 11 read on the corresponding limitations in computer usable medium claims 17-20, 24-25, and 27.

9. **Claims 5-7 and 21-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Iovanna in view of Nasrallah as applied to the claims above, and further in view of the admitted prior art (hereinafter the “APA”).

Regarding claim 5, Iovanna in view of Nasrallah discloses:

A method for co-modelling according to claim 2, wherein the packet network topology input comprises information regarding a plurality of routers (routers 10-15 in Fig. 2) in the simulated packet network, information regarding source-destination router ordered pairs in the simulated packet network (e.g., pair of nodes in paragraph [0077]), and information regarding a plurality of packet links in the simulated packet network (e.g., link information in paragraph [0076]).

However, Iovanna in view of Nasrallah does not expressly disclose:

wherein assigning each packet link of the simulated packet network a flow comprises the steps of:

(1) setting capacity to zero for all packet links;

(2) performing a series of steps, as follows, for each source-destination router ordered pair;

A. determining a shortest packet path between routers;

B. establishing a source-destination packet traffic flow based on the shortest packet path; and

C. incrementing capacity of each packet link traversed by the packet traffic flow; and

(3) increasing capacity of packet links per packet network engineering guidelines.

Regarding “setting capacity to zero for all packet links”, a zero setting is a common default value for computations. So, this would be an obvious variation.

Regarding “series of steps” for each pair, it would be obvious to perform route computation (e.g., paragraph [0077]) for each pair for the purpose of thoroughly computing routes for all pairs.

Regarding steps A and B, the APA teaches that these steps correspond to known traffic engineering techniques (APA, p. 14, l. 12-19). So, obvious variations could employ these techniques for their known benefits.

Regarding step C, one would obviously increment the capacity assignment for the packet links traversed by the packet traffic flow from zero to their assignment values.

Regarding “increasing capacity”, one would obviously do so to maximize the capacity for the packet links for maximum traffic throughput.

Regarding claim 6, Iovanna in view of Nasrallah discloses:

A method for co-modelling according to claim 2, wherein the optical network topology input comprises information regarding a plurality of cross-connect switches (OXCs 20-25 in Fig. 2) in the simulated optical network and information regarding a plurality of optical links (e.g., physical level in paragraph [0069]) in the simulated optical network.

However, Iovanna in view of Nasrallah does not expressly disclose:

wherein assigning each optical link of the simulated optical network a flow comprises the steps of:

(1) setting capacity to zero for all optical links;

(2) performing a series of steps, as follows, for each packet link between two routers:

A. determining a shortest optical path between cross-connect switches supporting the two routers;

B. establishing an optical connection to support the packet link; and

C. incrementing capacity of each optical link traversed by the optical connection; and

(3) increasing capacity of optical links per optical network engineering guidelines.

Regarding “setting capacity to zero for all packet links”, a zero setting is a common default value for computations. So, this would be an obvious variation.

Regarding “series of steps” for each pair, it would be obvious to perform route computation (e.g., paragraph [0077]) for each pair for the purpose of thoroughly computing routes for all pairs.

Regarding steps A and B, the APA teaches that these steps correspond to known traffic engineering techniques (APA, p. 16, l. 9-18). So, obvious variations could employ these techniques for their known benefits.

Regarding step C, one would obviously increment the capacity assignment for the optical links traversed by the optical connection from zero to their current assignment values.

Regarding “increasing capacity”, one would obviously do so to maximize the capacity for the optical links for maximum traffic throughput.

Regarding claim 7, claim 7 is a method claim that introduces limitations that correspond to the limitations introduced by method claim 6. Therefore, the recited steps in method claim 6 read on the corresponding steps in method claim 7.

Regarding claims 21-23, claims 21, 22, and 23 are computer usable medium claims that introduce limitations that correspond to the limitations introduced by method claims 5, 6, and 7,

respectively. Therefore, the recited steps in method claims 5-7 read on the corresponding limitations in computer usable medium claims 21-23.

10. **Claims 10 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Iovanna in view of Nasrallah as applied to the claims above, and further in view of Doverspike et al. (U.S. Patent Application Publication No. US 2004/0107382 A1, hereinafter "Doverspike").

Regarding claim 10, Iovanna in view of Nasrallah does not expressly disclose:

A method for co-modelling and analyzing according to claim 8, wherein the step of performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprises analyzing survivability of the simulated packet network and the simulated optical network over which the simulated packet network operates.

However, such analysis of survivability is a common consideration for networks, as shown by Doverspike (e.g., consideration of fault recovery and restoration in paragraphs [0002-0004]). One of ordinary skill in the art would have been motivated to do this since it is generally known that modern telecommunication networks are reconfigurable and should provide for fast restoration from network failures (Doverspike, paragraph [0002]).

Regarding claim 26, claim 26 is a computer usable medium claim that introduces limitations that correspond to the limitations introduced by method claim 10. Therefore, the recited steps in method claim 10 read on the corresponding limitations in computer usable medium claim 26.

11. **Claims 12-16 and 28-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over Iovanna in view of Nasrallah and Doverspike as applied to the claims above, and further in view of Ghani et al. ("On IP-over-WDM Integration", hereinafter "Ghani").

Regarding claims 12, Iovanna in view of Nasrallah and Doverspike discloses:

A method for co-modelling and analyzing according to claim 8, wherein the step of performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprises performing survivability analysis (e.g., consideration of fault recovery and restoration in paragraphs [0002-0004]).

Iovanna in view of Nasrallah and Doverspike does not expressly disclose:

wherein an optical failure is known to occur within the simulated optical network, the step further comprising the steps of:

(1) establishing at least one protection mechanism for each point-to-point connection in the simulated packet network;

(2) performing a series of steps, as follows, for each optical link in the simulated optical network:

A. switching all affected packet traffic flow to an at least one protection mechanism;

B. incrementing capacity of each optical link traversed by the at least one protection mechanism; and

C. restoring initial capacity values; and

(3) summing capacity requirements.

Regarding “establishing at least one protection mechanism” for each connection, it would be obvious to consider at least one protection mechanism for each connection for proper consideration of fault recovery for each connection. Additionally, proper consideration for each connection can lead to improved channel availability, as shown by the maximally-disjoint teaching of Ghani (p. 78, col. 2, l. 5).

Regarding step A, switching all affected traffic to the protection mechanism is the obviously intuitive way to treat affected traffic. Otherwise, traffic not on the protection mechanism would be lost.

Regarding step B, one would obviously increment the capacity assignment for the optical links traversed by the protection mechanism to their current assignment values.

Regarding step C, one would obviously do so to resume the normal “faultless” network operation condition.

Regarding claim 13, claim 13 is a method claim that introduces limitations that correspond to the limitations introduced by method claim 12. Therefore, the recited steps in method claim 12 read on the corresponding steps in method claim 13.

Regarding claims 14, Iovanna in view of Nasrallah, Doverspike, and Ghani discloses:

A method for analyzing survivability of a simulated packet network (Iovanna, upper part of Fig. 2; Nasrallah, see the treatment of the "simulated" limitation under claim 1 above) and a simulated optical network over which the simulated packet network operates (Iovanna, lower part of Fig. 2; Nasrallah, see the treatment of the "simulated" limitation under claim 1 above), the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, wherein an optical failure (e.g., Doverspike, "fiber cut" in paragraph [0030]) is known to occur within the simulated optical network and wherein packet link protection (e.g., Doverspike, 406 in Fig. 4) is performed in the simulated packet network.

Iovanna in view of Nasrallah, Doverspike, and Ghani does not expressly disclose:

the method comprising the steps of:

(1) establishing at least one back-up packet traffic flow tunnel for each packet link in the simulated packet transport network;

(2) performing a series of steps, as follows, for each optical link in the optical network:

A. taking an optical link out of service;

B. performing a series of steps, as follows, in a nested process for each packet link affected by the optical failure;

i. switching all packet traffic flow on the affected packet link to an at least one back-up packet traffic flow tunnel;

ii. incrementing capacity of each packet link traversed by the at least one back-up packet traffic flow tunnel; and

iii. incrementing capacity of each optical link traversed by an optical connection supporting the packet link; and

C. restoring initial capacity values; and

(3) summing packet link capacity requirements and optical link capacity requirements.

Regarding “establishing at least one back-up packet traffic flow tunnel” for each packet link, it would be obvious to consider at least one back-up packet traffic flow tunnel for each packet link for proper consideration of fault recovery for each packet link. Additionally, proper consideration for each packet link can lead to improved channel availability, as shown by the maximally-disjoint teaching of Ghani (p. 78, col. 2, l. 5).

Regarding step A, the “optical failure” implies that an optical link is taken out of service.

Regarding step B, a nested process is a common and obvious way to loop through each affected link.

Regarding step i, switching all affected traffic to the protection mechanism is the obviously intuitive way to treat affected traffic. Otherwise, traffic not on the protection mechanism would be lost.

Regarding steps ii and iii, one would obviously increment the capacity assignment for the packet and optical links traversed by the protection mechanism to their current assignment values.

Regarding step C, one would obviously do so to resume the normal “faultless” network operation condition.

Regarding “summing” capacity requirements, one would obviously do so to find total capacity requirements for the entire network.

Regarding claims 15, Iovanna in view of Nasrallah, Doverspike, and Ghani discloses:

A method for analyzing survivability of a simulated packet network (Iovanna, upper part of Fig. 2; Nasrallah, see the treatment of the “simulated” limitation under claim 1 above) and a simulated optical network over which the simulated packet network operates (Iovanna, lower part of Fig. 2; Nasrallah, see the treatment of the “simulated” limitation under claim 1 above), the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, wherein an optical failure (e.g., Doverspike, “fiber cuts” in paragraph [0004]) is known to occur within the simulated optical network and wherein packet link protection is performed in the simulated optical network (e.g., Doverspike, optical layer failure recovery in paragraph [0004]).

Iovanna in view of Nasrallah, Doverspike, and Ghani does not expressly disclose:

the method comprising the steps of:

(1) establishing at least one protection tunnel for each optical connection in the simulated optical network;

(2) performing a series of steps, as follows, for each optical link in the simulated optical network:

A. taking an optical link out of service;

B. switching all affected optical connections to an at least one protection tunnel;

C. incrementing capacity of each optical link traversed by the at least one protection tunnel; and

D. restoring initial capacity values; and

(3) summing the optical link capacity requirements.

Regarding “establishing at least one protection tunnel” for each optical connection, it would be obvious to consider at least one protection tunnel for each optical connection for proper consideration of fault recovery for each optical connection. Additionally, proper consideration for each optical connection can lead to improved channel availability, as shown by the maximally-disjoint teaching of Ghani (p. 78, col. 2, l. 5).

Regarding step A, the “optical failure” implies that an optical link is taken out of service.

Regarding step B, switching all affected traffic to the protection mechanism is the obviously intuitive way to treat affected traffic. Otherwise, traffic not on the protection mechanism would be lost.

Regarding step C, one would obviously increment the capacity assignment for the optical links traversed by the protection mechanism to their current assignment values.

Regarding step D, one would obviously do so to resume the normal “faultless” network operation condition.

Regarding “summing” capacity requirements, one would obviously do so to find total capacity requirements for the optical network.

Regarding claims 16, Iovanna in view of Nasrallah, Doverspike, and Ghani discloses:

The method according to claim 14, wherein the packet traffic flow is LSP (Label Switch Path) traffic flow (Iovanna, paragraph [0054]).

Regarding claims 28-32, claims 28, 29, 30, 31, and 32 are computer usable medium claims that introduce limitations that correspond to the limitations introduced by method claims 12, 13, 14, 15, and 16, respectively. Therefore, the recited steps in method claims 12-16 read on the corresponding limitations in computer usable medium claims 28-32.

<u>Response to Arguments</u>

12. Applicant's arguments filed 14 September 2007 have been fully considered but they are either moot or not persuasive. Applicant presents eleven salient points.

Regarding the first point, Applicant states:

> The Examiner has equated the limitation of "generating a basic packet capacity comprising a capacity value for each packet link" which is recited in claim 1 with "generating a cost parameter comprising a cost value for each packet link", as identified above. The Examiner has further stated that "generating a cost parameter comprising a cost value for each packet link" is disclosed in step 520 of Figure 5 of Iiana et al., which discloses "assign weight to link". The weight is disclosed in Iovanna et al. in paragraph [0067] as for "'indicating a cost outgoing the link for transport of the data packet, which cost refers to one or more first critical constraints or required resources". In a particular example, this may be the "total <u>available</u> link bandwidth". As further disclosed in paragraph [0083], in step 520, the weight is set with respect to a constraint based metric at the logical level and usually corresponds to aggregate information at the physical level, for example <u>available</u> bandwidth. The "<u>available</u> bandwidth is considered on the whole link, and is calculated as the <u>sum of all of the spare bandwidths available</u> over all of the wavelengths in all of the fibers that constitute the link". The definition of "capacity" according to Webster's Online Dictionary is "the maximum amount that can be contained or accommodated". Therefore, as Iiana et al. is directed to <u>available</u> bandwidth, that is spare bandwidth, Iiana et al. does not disclose "generating a basic packet <u>capacity</u> comprising a <u>capacity value for each packet link</u>", as the capacity value for each packet link recited in claim 1 is a maximum allowable bandwidth for each link.

(REMARKS/ARGUMENTS, p. 21, middle paragraph, emphasis Applicant’s).

Examiner respectfully notes that the claim language does not make a distinction between “available bandwidth” and “maximum allowable bandwidth”. Rather, the claim language simply states the term “capacity”, and note that Iovanna employs the term “available capacity” (paragraph [0084]). While Applicant’s interpretation of “capacity” is appreciated, the term is not as narrow as described in Applicant’s point, as shown by Iovanna’s use of the term “capacity”. Accordingly, this point is not persuasive.

Regarding the second point, Applicant states:

> Furthermore, Applicant submits that a weight value is not typically a capacity value per so, but is a normalized value, such as specifically disclosed in paragraph [0087] of Iovanna et al. As such, Applicant submits that the Examiner's equating of <u>a cost value</u> to the <u>basic packet capacity</u> recited in claim 1 is in error.

(REMARKS/ARGUMENTS, p. 21, last paragraph, emphasis Applicant's).

Examiner respectfully notes that the standing rejection does not "***equate***" cost to capacity. Rather, the standing rejection notes "a cost parameter that ***comprises*** a basic packet capacity". Accordingly, this point is not persuasive.

Regarding the third point, Applicant states:

> In addition to the above comments, Applicant directs the Examiner's attention to the fact that claim 1 recites "a basic packet capacity comprising a capacity value <u>for each packet link</u>". This defines that the basic packet capacity includes capacities for each packet link. Iovanna et al. discloses assigning a weight for each link separately, as indicated by the Examiner, via the loop that allows weights to be assigned for other links, block 545 in Figure 5. Applicant submits that what Iovanna et al. discloses is <u>each logical link having an assigned weight, not a value that includes the assigned weights of all of the links</u>.
>
> While Iovanna et al. may suggest that multiple weights may be combined for determining an optimized path through the network, Applicant submits that not all of the links in the network would be included when traversing the network from a start node to an end node as this would not result in an optimized path through the network. There is no indication of all the weights forming "a basic packet capacity", or "a cost parameter comprising a cost value of each packet link" as alleged by the Examiner. Iiana et al. does not perform generating <u>a basic packet capacity comprising a capacity value for each packet link</u> based on packet network topology information and packet traffic information, but discloses assigning separate cost parameters, which may be based on the sum of available bandwidth of the physical links, to each logical link to aid in determining an optimal path through the network.

(REMARKS/ARGUMENTS, p. 22, first two paragraphs, emphasis Applicant's).

Examiner respectfully points out the incorporation of "C_{max}^{TL}". C_{max}^{TL} is the maximum link total capacity in the network (Iovanna, paragraph [0087]). Such "total" capacity incorporates the capacity value for each link, which would include each packet link. Accordingly, this point is not persuasive.

Regarding the fourth point, Applicant states:

> With regard to the limitation of "generating a basic optical capacity comprising a capacity value for each optical link based on optical network topology information and the basic packet capacity" the Examiner appears to be equating the expression "a basic optical capacity" in the claim with "the availability of bandwidth at the wavelength level" disclosed in paragraph [0071], the expression "'a capacity value for each optical link" in the claim with the loop that allows weights to be assigned for other links, i.e. block 545 in Figure 5, and the expression "based on optical network topology information and the basic packet capacity" with the disclosure in paragraph [0069].

> Paragraph [0069] states that "At step 525, information specifically regarding the physical level is taken into account checking for availability at the physical level of an actual physical link able to meet the requirements of a second critical resource or second constraint, which may be an equivalent, or be influenced by, the first resource or constraint taken into account at the logical level" (emphasis added). Therefore, this appears to indicate the second constraint is dependent upon the first constraint.
>
> However, in paragraph [0070], it is disclosed that "the second critical resource may also be an independent constraint which is critical to the correct operation of the optical layer" (emphasis added) and paragraph [0071] explicitly states "In this case it is assumed that the second constraint is the availability of bandwidth at the wavelength level" (emphasis added). Therefore, Applicant submits that generating a second constraint which is "the availability of bandwidth at the wavelength level" disclosed at paragraph [0071] is not equivalent to "generating a basic optical capacity comprising a capacity value for each optical link based on optical network topology information and the basic packet capacity" because Iiana et al. clearly states for this example, the second constraint is an independent constraint. Since the second constraint is not dependent on the first constraint, Iiana et al. does not disclose "generating a basic optical capacity comprising a capacity value for each optical link based on optical network topology information and the basic packet capacity". The Examiner has alleged that Iiana et al. discloses the particular limitation, but has cited elements of Iovanna et al. that disclose two separate and contradictory conditions, one in which the second critical condition is independent of the first critical condition and one where it is dependent upon the first critical condition. Applicant submits that such selection of elements is inappropriate, as at least one of the conditions, the one being more heavily relied upon by the Examiner is contradictory to the other.
>
> (REMARKS/ARGUMENTS, p. 22, last full paragraph - p. 23, middle paragraph, emphasis Applicant's).

Examiner respectfully acknowledges Applicant's interpretation of Iovanna. However, notice the new ground of rejection regarding this point, i.e., Iovanna's paragraph [0069]. In particular, notice the "availability at the physical level of an actual physical link able to meet the requirements of a second critical resource or second constraint, which may be an equivalent, or be influenced by, the first resource or constraint taken into account at the logical level". Clearly, the second resource or constraint would be "based on" the first resource or constraint. Accordingly, this point is moot.

Regarding the fifth point, Applicant states:

> In addition, for at least the same reasons discussed above that Iovanna et al. does not disclose "a basic packet capacity comprising a capacity value for each packet link", Applicant submits that Iiana et al. does not disclose "'a basic optical capacity comprising a capacity value for each optical link". That is, Iovanna et al. does not disclose an optical capacity that includes the capacities of all of the links and only pertains to using available bandwidth on physical links, not maximum bandwidths that define the optical capacity on respective links.
>
> (REMARKS/ARGUMENTS, p. 23, last paragraph, emphasis Applicant's).

Notice the new ground of rejection regarding this point, i.e., Iovanna's paragraph [0069]. Notice the incorporation of the cost parameter by equivalence or by influence in paragraph [0069], which would

incorporate "C_{max}^{TL}". Similar to the treatment of third point above, Examiner respectfully points out the incorporation of "C_{max}^{TL}". C_{max}^{TL} is the maximum link total capacity in the network (Iovanna, paragraph [0087]). Such "total" capacity incorporates the capacity value for each link, which would include each optical link. Accordingly, this point is moot.

Regarding the sixth point, Applicant states:

> Claim 8 recites similar subject matter to claim 1, along with an additional limitation of performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates. For the same reasons as discussed above regarding claim 1, Applicant submits that the combination of Iovanna et el. and Nasrallah is not directed to the same subject matter as the present application, and does not disclose performing method steps that are at all related to what is recited in claim 8.
>
> With regard to the additional limitation, the Examiner alleges that Iovanna discloses performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates" in the form of block 565 of Figure 5., the results illustrated in Figures 6-9, analysis being implied by "state information'" in paragraphs [0062]-[0063], the use of the expression "analysis" in paragraph [0066] and the expression "check" in paragraph [0071].
>
> Block 565 of Figure 5 is a step in a method of determining an optimal path between two nodes era network. Paragraph [0080] of liana et al. discloses "if more that one link is available, a criterion is applied at step 565 to select the most appropriate physical link, as will be better detailed hereafter, otherwise the only available one is picked". Applicant submits that the step of block 565 is totally unrelated to performing analysis on a simulated network, it is merely directed to a manner of selecting an appropriate physical link for routing a data packet in an actual network.
>
> Applicant submits what is illustrated in Figures 6-9, is not "performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates" as recited in claim 8. The results illustrated in Figures 6-9 are comparisons of performance using different criteria in the choice of physical links [0044]. The figures compare results achieved by a method of the proposed invention of liana et al. to other known ways to perform a similar activity. This is not something that is performed as part of the standard operation of Iovanna et al, but is a comparison in the patent to show the "improvement" provided by Iovanna et al.
>
> With regard to the use of "state information" in paragraphs [0062]-[0063], Applicant submits that this is merely information about the network, status of the link, network topology, connectivity of nodes, etc, and does not pertain to analysis being performed on the network.
>
> With regard to '"analysis" in paragraph [0066], this term is being used to describe the operations disclosed in Iovanna et al. that the Examiner is equating to the two "generating" limitations recited prior to the "analyzing" limitation in claim 8. As the two "generating" limitations are distinct and separate from the "analyzing" limitation, it is improper for the Examiner to equate the same elements in liana et al. for both the "generating" limitations and the "analyzing" limitation.
>
> With regard to "check" in paragraph [0071], this term again is part of the disclosure in Iovanna et al. that the Examiner is equating to the "generating" limitations in claim 8. Applicant submits that it is improper for the Examiner to equate the same elements in Iovanna et al. for both the "generating" limitations and the '"analyzing" limitations.

(REMARKS/ARGUMENTS, p. 24, last paragraph - p. 26, first full paragraph).

First, Examiner respectfully notes an established definition of the term "analysis" from Merriam-Webster's Online Dictionary (www.merriam-webster.com): an examination of a complex, its elements, and their relations. Second, Examiner respectfully notes that the standing rejections are applied in view of the combination of Iovanna and Nasrallah such that simulated versions of the networks of Iovanna are employed.

Regarding block 565 of Fig. 5, the application of the criterion at step 565 constitutes an examination of a complex, its elements, and their relations, i.e., performing analysis. In view of the combination of Iovanna and Nasrallah, it would also constitute performing analysis on a *simulated* network. Accordingly, this point is not persuasive.

Regarding the performance comparisons in Figs. 6-9, just the examination of the performance of Iovanna's network alone constitutes an examination of a complex, its elements, and their relations, i.e., performing analysis. In view of the combination of Iovanna and Nasrallah, it would also constitute performing analysis on a *simulated* network. Accordingly, this point is not persuasive.

Regarding the "state information" in paragraph [0062-0063], acquiring information, for each link, about the status of the link, the topology, the connectivity among the network nodes, etc., constitutes an examination of a complex, its elements, and their relations, i.e., performing analysis. In view of the combination of Iovanna and Nasrallah, it would also constitute performing analysis on a *simulated* network. Accordingly, this point is not persuasive.

Regarding the seventh point, Applicant states:

> As discussed above, Applicant submits that one skilled in the art would not combine the subject matter of Iovanna et al. and Nasrallah as simply simulating the methods of Iovanna et al. on a simulated network in a manner disclosed by Nasrallah, would not result in the claimed invention. Iovanna et al. is directed to routing strategies for packets, so even if this was simulated before implementation on an existing network, which is the intended purpose of Iovanna et al. this does not result in the claimed subject matter of the present invention, for the reasons discussed above. Applicant further submits that one skilled in the art would not consider combining the cited references as they are directed to different purposes, routing on existing networks and modelling of networks to accommodate expected traffic flows.
>
> In addition, the Examiner's motivation for combining Iiana et al. with Nasrallah, set out on page 4, is tied to his view that Iovanna et al. teaches the limitations recited in claim 1. As detailed above, this is an incorrect interpretation of Iovanna et al., and as such this affects the Examiner's reason to combine argument.

(REMARKS/ARGUMENTS, p. 27, first two full paragraphs).

Examiner respectfully notes that the strength of the obviousness argument resides in the basic and well-known concept of simulation. Nasrallah only provides one example of simulating networks. The standing rejections do not rely on other minute details of Nasrallah. Applicant's point does not address the merits of the obviousness of the basic and well-known concept of simulation. Accordingly, this point is not persuasive.

Regarding the eighth point, Applicant states:

> Independent claims 14 and 15 are directed to methods for analyzing survivability of a simulated packet transport network. As described on page 3, lines 22-25 of the present application, "A survivability analysis on the network allows a user to simulate a failure of any single optical link in the simulated packet transport network and examine how this affects the traffic carrying requirements of the network". Applicant submits that the combination of Iiana et al. and Nasrallah is not directed to analyzing survivability of a simulated packet network, as alleged by the Examiner. Iovanna et al. in particular is unrelated to what is disclosed in the present invention and recited in claims 14 and 15. Applicant submits that Iiana et al. and Nasrallah do not in combination disclose all the limitations of claims 14 and 15 that are alleged by the Examiner to be disclosed by Iiana et al. and Nasrallah.
>
> (REMARKS/ARGUMENTS, p. 28, second paragraph).

Examiner respectfully notes that the standing rejections rely on Doverspike for analysis of survivability. In view of the combination of Iovanna and Nasrallah and Doverspike, there would be analysis of survivability on a *simulated* network. Accordingly, this point is not persuasive.

Regarding the ninth point, Applicant states:

> Regarding the Examiner's response to the first point, Applicant submits that, as discussed above, the loop used in assigning weights to each link in Figure 5 is not equal to the basic packet capacity comprising a capacity for each packet link recited in independent claims 1 and 8. With regard to the issue of generating versus utilizing, Applicant does not totally agree with the Examiner's suggestion that an object must be generated before it is utilized, in the context of the claims. In particular, there is no suggestion or disclosure in Iiana et al. that capacity values of packet links and optical links are generated in the methods disclosed by Iovanna et al. Iovanna et al. has links with fixed capacity, as an existing network, with <u>variable available bandwidths</u>.
>
> (REMARKS/ARGUMENTS, p. 29, last paragraph, emphasis Applicant's).

Examiner respectfully notes that the standing rejections do not rely on Iovanna alone. Rather, in view of the combination of Iovanna and Nasrallah, the standing rejections rely on a *simulated* version of the network of the prior art of record. All of the various parameters of a *simulation* must be generated before they are utilized. According this point is not persuasive.

Regarding the tenth point, Applicant states:

> Regarding the Examiner's response to the second point, Applicant submits that, as discussed above, the fact that Nasrallah may be directed to simulated networks, does not mean that one skilled in the art would combine Nasrallah with Iiana et al. Nasrallah may teach simulating networks, but this does not change the issue that Iovanna et al. does not teach the limitations of the rejected claims.
>
> (REMARKS/ARGUMENTS, p. 30, first paragraph).

Notice the new ground of rejection applied in view of the new application of Iovanna, e.g., Iovanna's paragraph [0069]. Accordingly, this point is moot.

Regarding the eleventh point, Applicant states:

> Regarding the Examiner's response to the third point, Applicant submits that, for the reasons discussed above, application of a criterion at step 565 is not analysis of the result of what is generated previous to step 565, but is simply application of a criterion for selecting a most appropriate physical link.
>
> (REMARKS/ARGUMENTS, p. 30, second paragraph).

This point is similar to the sixth point above, so this point is treated similarly. Examiner respectfully notes an established definition of the term "analysis" from Merriam-Webster's Online Dictionary (www.merriam-webster.com): an examination of a complex, its elements, and their relations. Regarding block 565 of Fig. 5, the application of the criterion at step 565 constitutes an examination of a complex, its elements, and their relations, i.e., performing analysis. Accordingly, this point is not persuasive.

Summarily, Applicant's arguments are either moot or not persuasive.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ghani (*IP Over Optical*) is cited to show traffic engineering for IP-over-optical networks (slides 52-58). In particular, notice the information flow process on slide 55.

Ghani (*IP-Over-WDM Integration Strategies*) is cited to show the interaction of protocols between optical and data layers (slide 8).

Kodialam et al. ("Integrated dynamic IP and wavelength routing in IP over WDM networks") is cited to show integrated routing, i.e., routing taking into account the combined topology and resource usage information at the IP and optical layers (abstract).

Liu (*IP over WDM*) is cited to show various aspects of IP over WDM optical networks, especially traffic engineering (chapter 7, p. 245+). IN particular, notice the simulation study of IP over WDM reconfiguration (p. 295+).

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID S. KIM whose telephone number is (571)272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. S. K./
Examiner, Art Unit 2613

/Kenneth N Vanderpuye/
Supervisory Patent Examiner, Art Unit 2613